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CLAIMS

[Utility model registration claim]

[Claim 1] Optometry equipment characterized by having arranged the display screen by the liquid crystal display which displays the image pick-up of said camera on an observer's view while having arranged the CCD camera directly or indirectly on the observation optical axis which observes a subject eye.

[Claim 2] A CCD camera is optometry equipment of claim 1 which enabled it to adjust the include angle of the focus and incident light shaft.

[Claim 3] It is claim 1 or the optometry equipment of 2 which has arranged the display screen on the observation optical axis of the eye of another side of the observer concerned while having arranged the CCD camera on the observation optical axis of one eye of an observer.

[Claim 4] The image pick-up of a CCD camera is one optometry equipment of claims 1-3 it was made to display on Monitor TV.

[Claim 5] A CCD camera is one optometry equipment of claims 1-4 which are made to carry out forward counterrotation of said motor by actuation of a foot switch, and displayed migration of said focus on the display screen while forming the focus in the cross direction of eyegrounds movable by revolution of a motor.

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DETAILED DESCRIPTION

[Detailed explanation of a design]

[0001]

[Industrial Application]

This design is related with the optometry equipment which replaces ophthalmoscopes, such as an eyegrounds image of a hand carry type or a **** type.

[0002]

[Description of the Prior Art]

The thing to which another observer enabled it to observe the eyegrounds image of a subject eye which an observer looks at directly in the ophthalmoscope of a hand carry type or a **** type from the former with Monitor TV etc. is known.

[0003]

Drawing 6 is what showed the outline of the configuration of the conventional example, it inserts a half mirror 3 on the observation optical axis L1 of the ophthalmoscope located between the subject eye 1 and an observer's eye 2, turns the eyegrounds image of the subject eye 1 to an optical-axis L2 side, inserts CCD camera 4 grade on this optical axis L2, and enables it to observe said eyegrounds image with a monitor TV 5 etc. In addition, 6 and 7 are recording devices with a controller unit, VTR, a still camera, etc. which are ****(ed) between CCD camera 4 and the monitor TV 5.

[0004]

However, although this equipment is satisfactory when the observation optical axis L1 and the optical axis L2 into which the direction was changed by the half mirror 3 are in agreement, if an observer shifts that eye 2 a little and the observation optical axis L1 sways for a while Since the half mirror 3 or CCD camera 4 is being fixed, although it is small in the eyegrounds image which carries out incidence to the eye 2 of the eyegrounds image which carries out incidence to CCD camera 3, and an observer, gap arises. Consequently, it will be said that an observation optical axis, a focus, or its both of the eyegrounds image [the eyegrounds image which the observer is looking at, and] projected on the monitor TV 5 do not correspond.

[0005]

[Problem(s) to be Solved by the Device]

Let it be a technical problem for this design to offer the optometry equipment which the eyegrounds image which an observer looks at, and the eyegrounds image projected on Monitor TV etc. are always images of the same part, and moreover serves as an eyegrounds image of the same focus in view of this point.

[0006]

[Means for Solving the Problem]

The configuration of this optometry equipment made for the purpose of solving the above-mentioned technical problem is characterized by having arranged the display screen by the liquid crystal display which displays the image pick-up of said camera on an observer's view while it arranges a CCD camera directly or indirectly on the observation optical axis which observes a subject eye.

[0007]

[Function]

Since an observer inspects a subject eye by seeing the image picturized with the CCD camera in the display screen, he will observe the same eyegrounds image as Monitor TV.

[0008]

[Example]

Next, it depends on drawing and the example of this design is explained. It is the side elevation in which the top view in which drawing 1 shows the optical system of an example of this optometry equipment, the side elevation in which drawing 2 shows the optical system of example of another of this optometry equipment, the side elevation in which drawing 3 shows the configuration of the focal control system of a CCD camera in the optometry equipment of drawing 2, the functional block diagram of focal control [in / in drawing 4 / the image pick-up system of the equipment of drawing 3], and drawing 5 show the front view of an example of a surface screen, and drawing 6 shows an example of the optical system of optometry equipment conventionally.

[0009]

In drawing 1, each observation optical axis of the eyes 12 and 13 of right and left of as opposed to [as opposed to / in the eye of the subject, and 12 and 13 / L11] the subject eye 11 in the eye of right and left of an observer and L12 of an observer and 14 11 The CCD camera which carried out insertion arrangement on the observation optical axis L11 of a left eye 12 here, and 15 are the liquid crystal display screens which carried out insertion arrangement on the observation optical axis L12 of a right eye 13. It is constituted so that the image picturized with said CCD camera 14 may be displayed on the confrontation of a right eye 13, and this constitutes an example of this optometry equipment. In addition, in drawing 1, it is omitting illustrating a controller unit, Monitor TV, etc.

[0010]

In drawing 1, it may arrange in the location from which it separated from the optical axis L11 through the half mirror (not shown) which did not insert CCD camera 14 in the observation optical axis L11 of a left eye 12 directly, but was inserted in this optical axis L11.

[0011]

It is an illumination-light shaft (not shown) in adjusting the focus of CCD camera 14 ****, looking at the eyegrounds image of the subject eye 11 currently picturized with CCD camera 14 with the equipment of drawing 1 in the display screen 15.

Since the eyegrounds image in the condition that adjust ***** and an observer wants can be displayed on the display screen 15, those who are looking at the image pick-up of this CCD camera 14 with Monitor TV (not shown) can also see the eyegrounds image of the same part as the eyegrounds image which the observer is looking at.

[0012]

Although the optometry equipment of drawing 1 used an observer's both eyes 12 and 13, this equipment shown in drawing 2 is what was constituted so that the eyegrounds image projected on the display screen 15 by an observer's left eye 12 or right eye 13 might be seen, and the eye 13 of another side or 12 performs the same observation as optometry equipment conventionally. In addition, insertion arrangement of CCD camera 14 is indirectly carried out through the mirror 16 here at the observation optical axis L11 (or L12). As for a controller unit and 18, in drawing 2, 17 is [a recording device and 19] Monitors TV. Moreover, in drawing 2, the same sign as drawing 1 shall show the same member and the same part.

[0013]

Drawing 3 shows the principle of the focus of CCD camera 14 in this equipment shown in drawing 2. That is, CCD camera 14 is constituted so that the focusing actuation of the optical system of the objective lens etc. can be been made to carry out by motor 14a, for example, forward and carrying out reverse and connecting a focus to the location of a request of the eyegrounds of the subject eye 11 can do said motor 14a by back ***** before a foot switch 20. Consequently, those who look at an observer and Monitor TV can observe the same part of the eyegrounds of a subject eye with the image of the

same focus. In addition, 21 is a source of the illumination light and 22 is a mirror. Moreover, the focus of the focus of said camera 14 very thing is possible with an auto focus or manual focus actuation.

[0014]

In CCD camera 14 of drawing 3, if it enables it to detect electrically the amount of sliding of objective lens optical system by connecting and preparing interlocking lever 14b in the optical system of the objective lens which slides on a lens-barrel, and connecting the head of this lever 14b with the slider of variable-resistance 14c, since the resistance of the optimal focus location is known beforehand, when looking for the optimal focus location, it is useful.

[0015]

Drawing 4 is the functional block diagram of the focal control in the optometry equipment of above-mentioned drawing 3.

The value of variable-resistor 14c which detects a motion of the objective lens of CCD camera 14 moved by motor 14a in drawing 4 By supplying the focal location display circuit 23 and inputting this into the image composition circuit 24 of CCD camera 14 The bar graph is made to make a criteria location as an example the display screen 15 where the eyegrounds image IG of drawing 5 is displayed in the condition of the focal location of said camera 14 display 15F, and it enables it to move to it at the side which shows said display 15F with the chain line with migration of a focal location. by this, the focus of CCD camera 14 moves in front of a foot switch 20, and is moving to the near side of eyegrounds by back ***** -- or it can grasp whether it is moving to the other side, observing the display screen 15.

[0016]

[Effect of the Device]

Since the eyes of an eyegrounds image are examined with a direct view, the eyegrounds image of a subject eye with which this optometry equipment is as above, and persons other than an observer and an observer are picturized by the CCD camera, and are displayed on the display screen and Monitor TV The point which delicate gap had produced in the eyegrounds image which the eyegrounds image and observer of the subject eye conventionally projected on Monitor TV with equipment are looking at is completely lost. Therefore, there is an advantage which is not acquired with the conventional optometry equipment that two or more observers can observe the same part of the eyegrounds of a subject eye as an eyegrounds image of the same focus about the eyegrounds image of a subject eye.

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TECHNICAL FIELD

[Industrial Application]

This design is related with the optometry equipment which replaces ophthalmoscopes, such as an eyegrounds image of a hand carry type or a **** type.

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PRIOR ART

[Description of the Prior Art]

The thing to which another observer enabled it to observe the eyegrounds image of a subject eye which an observer looks at directly in the ophthalmoscope of a hand carry type or a **** type from the former with Monitor TV etc. is known.

[0003]

Drawing 6 is what showed the outline of the configuration of the conventional example, it inserts a half mirror 3 on the observation optical axis L1 of the ophthalmoscope located between the subject eye 1 and an observer's eye 2, turns the eyegrounds image of the subject eye 1 to an optical-axis L2 side, inserts CCD camera 4 grade on this optical axis L2, and enables it to observe said eyegrounds image with a monitor TV 5 etc. In addition, 6 and 7 are recording devices with a controller unit, VTR, a still camera, etc. which are ****(ed) between CCD camera 4 and the monitor TV 5.

[0004]

However, although this equipment is satisfactory when the observation optical axis L1 and the optical axis L2 into which the direction was changed by the half mirror 3 are in agreement, if an observer shifts that eye 2 a little and the observation optical axis L1 sways for a while Since the half mirror 3 or CCD camera 4 is being fixed, although it is small in the eyegrounds image which carries out incidence to the eye 2 of the eyegrounds image which carries out incidence to CCD camera 3, and an observer, gap arises. Consequently, it will be said that an observation optical axis, a focus, or its both of the eyegrounds image [the eyegrounds image which the observer is looking at, and] projected on the monitor TV 5 do not correspond.

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EFFECT OF THE INVENTION

[Effect of the Device]

Since the eyes of an eyegrounds image are examined with a direct view, the eyegrounds image of a subject eye with which this optometry equipment is as above, and persons other than an observer and an observer are picturized by the CCD camera, and are displayed on the display screen and Monitor TV. The point which delicate gap had produced in the eyegrounds image which the eyegrounds image and observer of the subject eye conventionally projected on Monitor TV with equipment are looking at is completely lost. Therefore, there is an advantage which is not acquired with the conventional optometry equipment that two or more observers can observe the same part of the eyegrounds of a subject eye as an eyegrounds image of the same focus about the eyegrounds image of a subject eye.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Device]

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MEANS

[Means for Solving the Problem]

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OPERATION

[Function]

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EXAMPLE

[Example]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The top view showing the optical system of an example of this optometry equipment.

[Drawing 2] The side elevation showing the optical system of example of another of this optometry equipment.

[Drawing 3] The side elevation showing the configuration of the focal control system of a CCD camera in the optometry equipment of drawing 2 .

[Drawing 4] The functional block diagram of the focal control in the image pick-up system of the equipment of drawing 3 .

[Drawing 5] The front view of an example of a surface screen.

[Drawing 6] The side elevation showing an example of the optical system of optometry equipment conventionally.

[Description of Notations]

11 Subject, Eye

12 Observer's Left Eye

13 Observer's Right Eye

14 CCD Camera

15 Display Screen

16 Mirror

17 Control Unit

18 Recording Device

19 Monitor TV

[Translation done.]

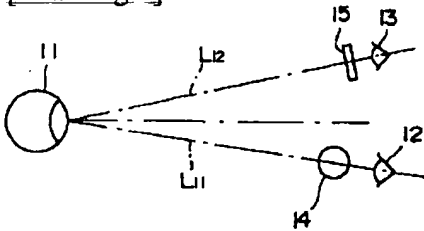
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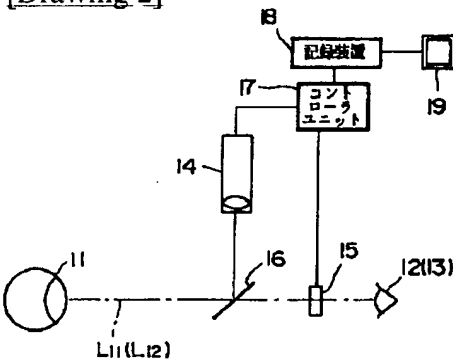
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DRAWINGS

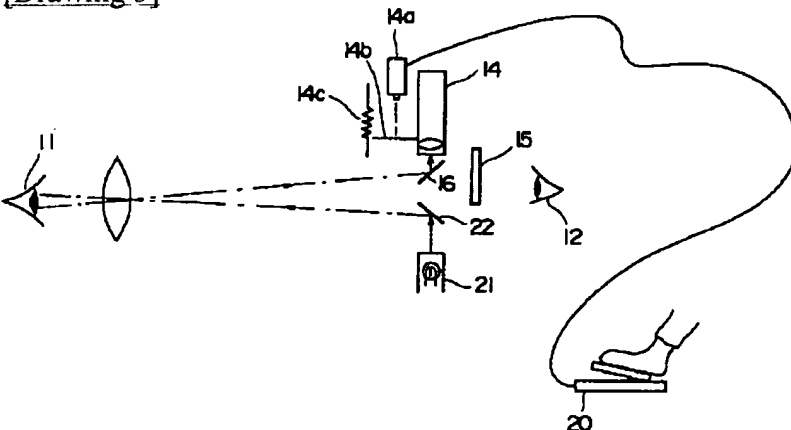
[Drawing 1]



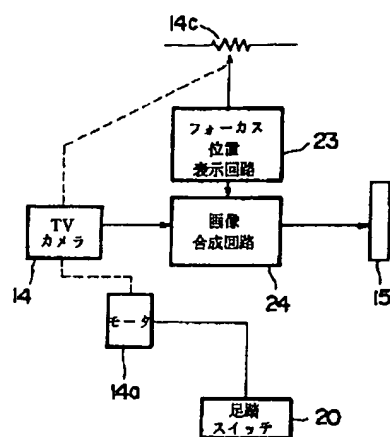
[Drawing 2]



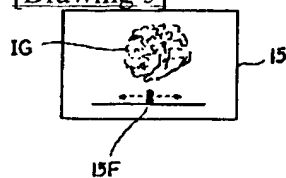
[Drawing 3]



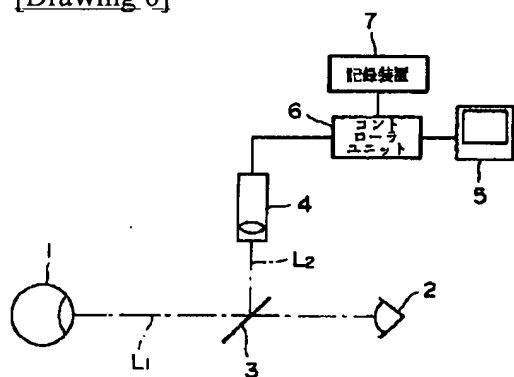
[Drawing 4]



[Drawing 5]



[Drawing 6]



[Translation done.]